Positions Moyennes pour l'Epoque de 1790·0 *des Etoiles Circumpolaires, dont les Observations ont été publiées par Jérome Lalande dans les Mémoires de l'Académie de Paris de* 1789 *et* 1790. Par Ivan Fedorenko, Astronome Surnuméraire à l'Observatoire de Poulkowa. St. Petersbourg, 1854.

It is generally known that MM. Hansen and Nissen calculated tables to facilitate the reduction of the stars contained in the *Histoire Céleste* of Lalande, which were published in 1825 by Schumacher, and that these tables were employed in the final reduction of the same stars executed under the auspices of the British Association, the results of which were published in 1847.

But, independently of the observations of the *Histoire Céleste*, the *Memoirs of the Academy of Sciences* for 1789 and 1790 contain a considerable number of similar observations, for which auxiliary tables had not been calculated, and which, consequently, were not included in the catalogue published by the British Association in 1847. The author, accordingly, at the suggestion of M. W. Struve, undertook the reduction of these observations. The results are now published under the above title. In an Introduction, extending to seventy-nine pages, the author, after explaining the general principles of reduction employed by him, gives a list of the stars contained in the Catalogue, classified into zones, as in the original observations. The total number of zones is 52, and the total number of stars is 4673. The Introduction is followed by the Catalogue. The epoch as mentioned in the title is 1790·0. There is also a supplementary catalogue of 339 stars, founded on 13 zones, contained in the *Histoire Céleste*, but omitted in the *Catalogue of the British Association*, and on two zones in the *Memoirs of the Academy of Sciences*. The stars of this latter catalogue are all very near the pole, for in seven of the zones the mean declinations are included between 74° and 80°, and in eight of them between 80° and 90°. The stars are, also, in general, very small.

The U.S. Naval-Astronomical Expedition to the Southern Hemisphere during the years 1849–52, Lieut. J. M. Gilliss, Superintendent. Vols. I. and II. Washington, 1855.

It is generally known to astronomers that Dr. Gerling, of Marburg, having, in 1847, suggested the expediency of making observations of *Venus* near her inferior conjunction at different stations on the earth's surface, for the purpose of obtaining a new determination of the solar parallax, Lieut. Gilliss, U.S.N., to whom

Dr. Gerling had communicated his views, warmly adopted the project, and succeeded in inducing the government of his country to fit out an expedition for the purpose of carrying it into effect. The Republic of Chile, in South America, was selected as likely to offer a suitable locality for making observations of the planet, to be used with simultaneous observations, which it was contemplated to execute at the National Observatory, Washington. The superintendence of the operations in Chile was intrusted to Lieut. Gilliss, whose merits as a practical astronomer had been amply established by his labours in connexion with the United States Survey. The expedition sailed from the United States in the autumn of 1849. Having erected an observatory at Santiago, upon his arrival in Chile, Lieut. Gilliss was enabled to commence astronomical observations in the month of December of the same year. Besides observations of *Venus* near her inferior conjunction, the plan of his labours included observations of *Mars* near opposition, to be used also for obtaining a value of the solar parallax, and an extensive series of observations of stars in the southern hemisphere. It was also contemplated to make a series of meteorological and magnetical observations. The expedition returned to the United States towards the close of 1852, after an absence of three years and three months.

A work embodying the results of this important expedition has been drawn up by Lieut. Gilliss, and is now being published at the expense of the Government of the United States. Vols. I. and II. have already appeared. They relate to the geography, climate, &c., of Chile. The remaining volumes, which will be devoted to the main objects of the expedition, will also soon be published.

The principal instruments used in the expedition consisted of two refractors equatoreally mounted, a meridian circle, a clock, and three chronometers. The larger equatoreal, with which the differential and micrometrical observations were executed, had a focal length of 8½ feet. The object-glass by Fitz, of New York, had a clear aperture of 6½ inches. The meridian circle was executed by Pistor and Martins, of Berlin. It had a focal length of 6 feet, and an aperture of 4⅓ inches.

The weather sometimes continued extremely favourable for observation during a long succession of nights.

"It was a great satisfaction," says the author, "to work with an instrument like ours, but there was almost too much of it. Out of 132 consecutive nights after the equatoreal was mounted there were only seven cloudy ones!"

Again, alluding to the state of the weather during the last summer of the expedition, the author says: "Between the 15th of December and the 15th of March, I had observations of *Mars* on seventy-eight nights! and out of one hundred and fifty-two, between November 10th and April 10th, there were observations with the meridian circle also on one hundred and twenty nights!

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Thus we had the satisfaction to accumulate from a previously unexplored, or almost unexplored field, an amount of astronomical data which has probably never been equalled within a similar period of time."

It ought to be stated, however, that on other occasions the weather continued cloudy for several months in succession.

At page 81 of vol. i. we find the following description of the zodiacal light:—

"These are the months* when the zodiacal light is brightest, and its perfectly formed pyramid is most distinctly traceable in the evening twilight. In no other part of the world have I ever remarked it so well. It is a pyramidal, or rather a lenticular body of light, which appears in the plane of the sun's equator, and is consequently inclined to the horizon after sunset before the vernal, and before sunrise after the autumnal equinox. The light, neither as ruddy as the glow of the sky after sunset, nor as silvery as rays heralding the moon, is usually so faint that few remark it, unless attention be directed to it; then every one wonders why it has so long escaped his attention. It is brightest about the horizon and fades gradually as it recedes; so that it is rarely definable at a greater altitude than 40°. The base of the cone or pyramid was never more than 15°, and generally much less in diameter when its outline became discernible, its apparent breadth depending wholly on the diaphaneity of the atmosphere at the time. It was seen as early as July 6th, and is once noted in our Journal 'very bright' as late as September 6th, its place in the heavens and inclination to the horizon changing as the sun gradually advanced from his northern limit towards us. No variations in the intensity or undulatory motion of the light, such as Humboldt mentions having witnessed in the tropical regions of South America, were ever seen by me in Chili; but only a mild radiance, whose brightness sensibly increased as the twilight faded, and more slowly disappeared an hour later; and by eight o'clock in the early days of September, (corresponding with our March) it was no longer perceptible to eyes that had been so greatly taxed. Whether this beautiful phenomenon consists of a ring of nebulous matter, revolving freely in space between the orbits of *Mars* and *Venus*, or is the outermost stratum of the solar atmosphere, is a question yet to be decided by physicists."

The author makes the following remarks upon the transparency of the atmosphere at Santiago: "Late in the season a sort of dry fog, resembling thin smoke, deprives the atmosphere by day of something of its transparency, though the nights are all that the astronomical observer can desire. Then the Andes, whose crests are not less than eighteen miles distant in an air-line, look almost within stone-throw, and the stars rise over them with a steadiness and brilliancy known in our climate only at mid-heaven. The

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* The autumnal months.

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observer will appreciate me when he is told that I have made very fair micrometrical measurements of *Venus*, when the planet was not more than 3° above the eastern horizon, and its crescent was more than once seen with the naked eye."

In a separate publication entitled, *An Account of the Origin and Progress of the Expedition*, which is intended to form part of one of the succeeding volumes, we find the following notes on the variations of η *Argus*, extracted from the author's journal :—

" 1850, Feb. 9. A bright, clear night, and steady atmosphere. Comparing the brightest visible stars, they rank— *Sirius*, *Canopus*, η *Argus*, α *Centauri*. The yellowish-red light of η *Argus* is more marked than that of *Mars*.

" Feb. 13. η *Argus* apparently less bright than α *Centauri*.

" March 31. η *Argus* is quite as bright as the two stars of α *Centauri*, and superior to all except *Sirius* and *Canopus*.

" April 15. η *Argus* approaches the brilliancy of *Canopus*.

" April 18. Night cloudless and without haze. After the observations, careful estimation placed η *Argus* quite equal with, if not superior in brightness to α *Centauri*. They were equidistant from the meridian.

" May 14. η *Argus* and α *Centauri* being at the same distance from the meridian, the former is considerably the brighter.

" May 16. η *Argus* more brilliant than the two stars of α *Centauri* combined.

" May 28. η *Argus* goes on increasing steadily. With the ruddiness of *Aldebaran*, its magnitude is only less than *Canopus*. Its change, since the close of October, has been nearly, if not full half a magnitude.

" June 3. To the unassisted eye the atmosphere is remarkably clear, the ' coal-sacks' of the *via lactea* being of startling blackness. η *Argus* and *Arcturus* have approximately the same colour; and although the latter is rather ruddier, the former is considerably the brighter. When compared, they had about the same altitude.

" July 5. η *Argus* is still as bright as the two stars of α *Centauri*.

" July 25. η *Argus* as bright or brighter than the two of α *Centauri*.

" July 28. η *Argus* is on the wane, and is now very little superior to α *Centauri*.

" 1851, May 18. η *Argus* certainly not so bright as α *Centauri*.

" December 28. η *Argus* quite as bright as α *Centauri*.

" 1852, January 22. η *Argus* no brighter than α *Centauri*.

" May 10. η *Argus* continued fully as bright as the double star α *Centauri* as late as the 15th of March last. Some nights I would estimate it a shade brighter; but when the two were at equal distances from the meridian, it was often impossible to detect any difference with the eye. Since then it has sensibly diminished. It comes nearer to my recollection of *Capella*, as seen in the northern hemisphere, than any other star."

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It may be remarked, in conclusion, that the two volumes already published contain a large mass of valuable and interesting information on the subjects to which they refer, accompanied with beautiful illustrations, and give promise that the work when completed will redound to the reputation of the author, and to the munificent liberality of the Government of the United States.

Beobachtungen des Bielaschen Cometen im Jahre 1852 *angestellt am grossen Refractor der Pulkowaer, Sternwarte, von O. Struve. Aus den Mémoires de l'Académie Impériale des Sciences de St. Petersbourg. Sixième série, Sciences Mathématiques et Physiques.* Tome vi., St. Petersbourg, 1854.

In this paper, M. Otto Struve gives an account of his observations of Biela's Comet, made with the great refractor of Pulkowa, on the occasion of the last apparition of the Comet in 1852. The first observation of the comet, that of the south following head, was obtained at Rome by Professor Secchi on the 25th of August. The comet was last seen in the Pulkowa refractor on the 28th of September. On this occasion it was the north following head which was visible. The comet was observed only at Rome, Cambridge, Berlin, and Pulkowa. The whole number of distinct observations of one or both of the heads of the comet, obtained during the period of its visibility, amounted to twenty-eight. Only five double observations were obtained, namely, three at Pulkowa and two at Rome. The following are a few extracts from the descriptive notes of M. Otto Struve, accompanying the details of the apparent positions of the comet as determined at the Pulkowa Observatory:—

"Sept. 18. Only one of the heads of the comet was recognised. This was the north preceding head, B. Its apparent diameter amounted to at least 30″. The nebulosity exhibited a considerable increase of brightness towards the centre, but there was no decided indication of a nucleus.

"Sept. 20. Both heads of the comet are distinctly seen. The head B is a little brighter than A, and has also a determinate nucleus. The nucleus of A is not so distinct as that of B. There is seen extending from it an emanation of bright nebulous matter in the direction of B.

"Sept. 23. A is to-night decidedly fainter than B, and exhibits no vestige of a nucleus. The unfavourable state of the atmosphere renders it difficult to perceive the elongated form of A. It is, however, evident that the nebulosity is not uniformly distributed about the point of maximum brightness. The nebulosity of B, on the other hand, is symmetrically situate with respect to the nucleus.